

Associating Information with Components in BIM: Level of Development

Overview

Building and design projects are increasingly requiring more than the 2D construction documents to the multidimensional implementation of Building Information Modeling (BIM). One of the powerful advantages of BIM is the association of information with building components. Associated information can include dimensions, weight, manufacturer, R- and U-value, cost and any other information useful during the design, construction and operation of the building. The Level of Development (LOD) defines the amount and type of information associated with a component, which can range from simple graphic representation to extensive system data.

Level of Development (LOD) is Article 3 of AIA Document G202™–2013, Project Building Information Modeling Protocol Form from The American Institutes of Architect's¹ revised 2013 AIA Digital Practice Documents from the unveiling 2007 Digital Practice documents. These are the documents and what they address in a general overview.

- **AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit**
To establish the parties' expectations for the use of digital data and building information modeling (BIM) on the project and provide a process for developing the detailed protocols and procedures that will govern the development, use, transmission and exchange of digital data and BIM on the project.
- **AIA Document G201™–2013, Project Digital Data Protocol Form**
To document the agreed upon protocols and procedures that will govern the transmission, use and exchange of digital data on a project, such as electronic project communications, submittals, contract documents and payment documents.
- **AIA Document G202™–2013, Project Building Information Modeling Protocol Form**
To document the agreed upon protocols and procedures that will govern the development, transmission, use and exchange of building information models on a project. It establishes the requirements for model content at five levels of development, and the authorized uses of the model content at each level of development.²



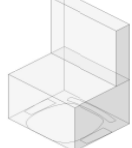


Intentions, Goals and Scalability

The LOD framework has become the most referenced of BIM documents. The intent to define & outline the degree of model elements, geometry and attached information, the goal of useable, credible information that is attached to a model within a 5 level range LOD 100-500. This scalable range allows practitioners or users to create, identify or extrapolate from a BIM model during a projects design process or lifecycle. The scale of information is outlined within the definitions of the Level of Development.

- **Conceptual, LOD 100:** The model element may be graphically represented in the model with a symbol or other generic representation, but does not satisfy the requirements for LOD 200. Information related to the model element (i.e., cost/sf, tonnage of HVAC, etc.) can be derived from other model elements.
- **Generic placeholder, LOD 200:** The model element is graphically represented within the model as a generic system, object, or

assembly with approximate quantities, size, shape, location, and orientation. Nongraphic information may also be attached to the model element.

- **Precise assemblies, LOD 300:** The model element is graphically represented within the model as a specific system, object, or assembly in terms of quantity, size, shape, location, and orientation. Non-graphic information may also be attached to the model element.
- **Specific Fabrication, LOD 400:** The model element is graphically represented within the model as a specific system, object, or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information. Nongraphic information may also be attached to the model element.
- **As-built, LOD 500:** The model element is a field-verified representation in terms of size, shape, location, quantity, and orientation. Nongraphic information may also be attached to the model element.²

LOD 100	LOD 200	LOD 300	LOD 400	LOD 500
				
Concept (Presentation)	Design Development	Documentation	Construction	Facilities Management
DESCRIPTION: Office Chair Arms, Wheels WIDTH: 700 DEPTH: 450 HEIGHT: 1100 MANUFACTURER: Herman Miller, Inc. MODEL: Mirra LOD: 100	DESCRIPTION: Office Chair Arms, Wheels WIDTH: 700 DEPTH: 450 HEIGHT: 1100 MANUFACTURER: Herman Miller, Inc. MODEL: Mirra LOD: 200	DESCRIPTION: Office Chair Arms, Wheels WIDTH: 700 DEPTH: 450 HEIGHT: 1100 MANUFACTURER: Herman Miller, Inc. MODEL: Mirra LOD: 300	DESCRIPTION: Office Chair Arms, Wheels WIDTH: 685 DEPTH: 430 HEIGHT: 1085 MANUFACTURER: Herman Miller, Inc. MODEL: Mirra LOD: 400	DESCRIPTION: Office Chair Arms, Wheels WIDTH: 685 DEPTH: 430 HEIGHT: 1085 MANUFACTURER: Herman Miller, Inc. MODEL: Mirra PURCHASE DATE: 01/02/2013

(Only data in red is useable)

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Conclusion

The LODs is just a portion of what is outlined in revised 2013 AIA Digital Practice Documents. It is however an important piece to help design teams and users to better specify BIM deliverables, to support design at any point in the design process and provide tangible language that can be referenced to for contracts and BIM execution plans.

Reference:

- (1) Guide, Instructions and Commentary to the 2013 AIA Digital Practice Documents. American Institute of Architects 2013.
- (2) Level of Development Specification Version 2013, bimforum.org August 22 (2013)
- (3) "What is this thing called LOD" practicalbim.net, March 01, (2013)